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ABSTRACT

To meet the needs of educationally disadvantaged college freshmen, a developmental reading program that emphasized student-generated questioning techniques was implemented at Manhattanville College (New York). The program was intended to help students comprehend and recall information from different subject areas and to organize complex topics into manageable units. The three major components of the instruction were: varying the rate of reading in relation to a purpose; generating questions; and predicting information, categories of information, and possible answers to the questions. The program used both teacher-supplied, commercially produced materials and student-supplied material from the content areas. Fourteen students participated in the initial course. Evaluation was done through both informal observations and formal testing, including a pretest and a posttest. The findings showed that the program offered was better than no reading program at all, but that it was not necessarily better than other possible programs. However, the high level of students' enthusiasm for applying the strategies to their regular class work was encouraging. (FL)

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INSTRUCTION IN STUDENT-GENERATED QUESTIONING TECHNIQUES

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Colleges, in an effort to provide substantive reading programs for underprepared college students, have investigated a variety of strategies. Because of the urgent need for students to be able to transfer any strategy to a variety of content area materials, we at Manhattanville College concluded that some of our students needed a program that would allow them to comprehend and recall different subject areas and organize complex topics into understandable units.

Review of the Literature

Recent studies indicate the need for students to actively interact with data in processing and comprehending information. Instruction in the development and use of questioning techniques has had a positive effect on achieving active student comprehension in many of these studies.

A look at the literature on student generated questioning techniques indicates a positive effect on achieving interactive student comprehension and reveals four important conclusions concerning the teaching of questioning techniques:

1) Student generated questioning is more effective for low verbal ability students than high. Andre and Anderson (1978) conducted two experiments to study whether students can be trained to select important information from text and to generate questions about them, and to see if this questioning technique facilitates comprehension and recall. In the first experiment a group of high school seniors was trained to generate questions from text by identifying main ideas and forming questions which asked for new instances of the concepts or the same concept in a paraphrased format. Pre and posttests measured students' ability to select the main idea and apply questioning techniques to new concepts. Ability to recall specific facts was required. Significant effects were found for question-trained students of low verbal ability. In the second experiment, groups which were taught questioning techniques scored

significantly higher on posttests and the group trained specifically in questioning techniques generated more good comprehension questions, i.e., more relevant to main ideas of text and requiring new examples of concepts. Of particular interest was the finding that for both studies, student generated questions were more effective for low verbal than high verbal students.

2) It is important to teach questioning techniques in a systematic, gradual manner, gradually phasing out teachers' questions while phasing in those of the students.

In his article "Active Comprehension: From Answering to Asking Questions", Singer (1978) discussed the value of questioning for comprehension and recall. Preposed questions, those asked prior to reading, direct students' attention to specific bits of information but at the expense of information not questioned. They give students a "searching attitude" while reading. Postponed questions, those asked following the text, lead students to process and comprehend more information since they believe that all material is equally relevant. Consequently they read more slowly but recall a wider range of material. According to Singer, the who, what, where, when, why, format of both pre and postposed questions are generally aimed at the literal level. They rarely stimulate students to comprehend and think at higher cognitive levels.

However, it is not only necessary to guide students thinking to higher levels but to teach students to ask these higher level questions on their own to make them independent learners. Lessons should begin with teacher-posed questions, in which students are aware of and learn to follow the teachers' model of questioning, and gradually, the teachers' questions are phased-out and replaced by the students' own questions. The students become involved in active comprehension. They respond to the text with questions that are continuously verified as they read.

3) Academically successful students are more cognitively active, i.e. they are able to identify and organize relevant material. Students identified

as being academically successful in college are more cognitively active (Goldman and Warren '73) and able to select, organize and synthesize relevant data. Driskell and Kelly (1980) attempted to teach freshmen who were predicted to fail how to focus attention, organize and manipulate information. They investigated differences in GPA, initial reading rate and comprehension between these subjects and students who did not receive training. Results indicated that the group trained in active information processing, focusing on selecting and organizing information, obtained significantly higher GPA and comprehension levels, no matter what the initial reading rate was.

4) Students need to learn to generate questions comprehensively, on the total text, rather than focus on certain aspects.

Frase and Schwartz trained a group of subjects to generate questions from text. Most student generated questions required verbatim, low level learning. A posttest indicated a significant effect on recall. Recall was highest on targeted items, i.e., items which were directly related to subjects' questions. This experiment plus a second similar one led Frase and Schwartz to conclude that question production results in improved recall of information directly related to questions, but may not cover all content of text. Recall for targeted items, i.e., items generated which are relevant to the posttest, is affected by questioning but recall for non-targeted items, i.e., posttest items not questioned by students was not affected.

Summary

The research reviewed indicates the possible usefulness of a program which incorporates structured instruction in student generated questions on a variety of levels, practice in paraphrasing and applying questioning strategies to different materials.

Developmental Reading Program

Course Description

Emphasis in the course was on instruction in skills that would be immediately useful and transferable to content area materials. In order to survive academically, the students needed to be able to read competently. They also needed the motivation of knowing that they could learn useful skills. The focus of the instruction was on reading skills that involved the active participation of the reader and on organizational strategies that could be applied to many of the content areas.

The three major components of the instruction were: varying the rate of reading in relation to a purpose, generating questions, and predicting information, categories of information and possible answers to the questions. These areas, for discussion purposes, must be separated. However, in actual instruction in the different components of the reading instruction progressed, students were taught organizational strategies which would utilize them.

Student Profile

The 14 students who participated in the Reading Course were educationally disadvantaged freshmen in the college's Higher Education Opportunity Program. They averaged a combined 727 SAT's scores (350 verbal 379 math), ranked in the third quintile in high school graduating class, and scored 10.1 on the California Achievement Test Level 6 in Reading with a range of 9.2 to 12.5.

These students all participated in an intensive 4 week pre freshman college prep program and, as freshmen, in a required 6 hour weekly academic support program in our College Skills Center. In the Fall this included the reading course, study skills and/or ESL programs, and 3 hours of content tutoring and specialized labs. In the Spring of freshman year, a writing/research course was substituted for the reading course, while the other two programs continued.

Materials

The materials used in the course were of two kinds, teacher supplied from commercial materials and student supplied from content area course material. Speed Learning formed the foundation for the teacher materials, supplemented by Reading Laboratory materials as well as readings from an assortment of workbooks written for college students in reading courses. Much of the work done in class initially was group instruction using these materials.

Outside of class and in individual tutorial sessions the students were encouraged to use the reading skills and questions strategies with their content materials.

Rate and Purpose

Practice was given in increasing rate by traditionally used techniques such as reading in increasingly larger units while using sweeping and economical eye movements. As Peggy Flynn noted, "Speed is the Carrot" (1977). Without exception, every student in the class wanted to increase their speed. However, as reading specialists and researchers know, instruction in these techniques might have some temporary effect on the speed of the movement of the eye, but little or no effect on comprehension or even long-term increase in speed without concurrent work in comprehension (Gibson and Levin, 1975).

Students were instructed in varying their rate according to a purposeful determination of the kinds and levels of information needed. Thus, we instructed in previewing, skimming, scanning and in-depth reading, emphasizing the controlled use of rate in relation to the question the student wanted answered.

Students were taught the close interrelationship between speed and comprehension. They learned that fast reading is not an end in itself but the result of better comprehension skills. They were taught to transfer their newly acquired skills and study techniques to their own textbooks and coursework.

Questions

Because of the positive results obtained in much of the literature from the active interaction with the text by the reader who is taught to generate his own questions, students were instructed in how to ask questions using "who, what, when, where, why, and how" as a base that could be applied to most content materials. Instruction, done in small steps, was sequential and structured. Using material that focused on one type of question at a time, the group read the question, predicted the answer based on what they already knew and then read to answer the question. Discussion and feedback focused on isolating the reasons for the answers, locating supporting evidence, and identifying the process used by students in arriving at answers. Actual answers were compared to predicted answers.

The questions themselves were related to the need for readers to vary the rate of reading. How and why questions generally require more in-depth reading than the other four questions. Gradually, the types of questions were combined until all were included in every passage. Questions generated by the instructor and the text provided models for future student generated questions. After practice with model questions, students previewed the text, established their questions, the rate needed and purpose for reading, and predicted possible answers. Sometimes questions, and often catagories were revised as the lesson progressed. Rereading was sometimes necessary to finish unanswered questions.

In the sample questioning lesson, (Appendix A), students used the five basic questions and developed sub questions on what they knew about puppetry (who uses them, what do they look like, when were they first used, etc.) After prereading they settled on Asian nations as categories; then they read and searched through to fill in the grid.

Prediction Strategies

The mature competent reader uses his already acquired schema and store of related knowledge to comprehend and recall information. The reader can also use these sources of information to predict what new information might be included in a text and to speculate about questions that might be raised and answered. Students were instructed in predicting. When presented with a title, a passage or a question they were encouraged to think about what they already knew and make a guess about what might be included in the item under consideration. They were thus reading to test their own ideas.

The strategy of prediction was specifically related to forming questions from the general "who, what, where, when, why and how" categories already introduced to them. If the students were going to read an article about war, they could identify some "who" questions based on what they already knew about war. The "who" category might include questions dealing with the protagonists (the opposing forces or countries), the participants (land soldiers including foot, artillery, etc. air force, including pilots, navigators, etc., support personnel, including red cross, nurses, etc.), the kinds and levels of authority (military and civilian). The students already possessed a great deal of information about the "who" category related to war. This could enable them to formulate and focus "who" questions relating to any war and make some predictions before beginning to read.

Organizational Strategies

A major emphasis in the course was placed on the independent use of the six basic questions as a means of comprehending and organizing complex written material. Students practiced previewing, predicting and generating questions using chapters from textbooks or articles. The subject matter chosen was complex and often involved more than one topic. The previewing provided an overview of what the chapter would contain and give a sense of what the questions should include.

Predicting on the basis of the previewing and what they might already know about the information in the chapter enabled the students to speculate about questions and possible answers. Finally, in order to organize the information they were taught to make a study grid with the questions down the left hand side of the paper and the topics across the top.

In the construction and use of the study grid, stress was placed on making predictions about questions and topics, and then revising or adding and deleting on the basis of evidence gained from the reading. This had a practical purpose of enabling the development of an accurate useful grid. It also had the purpose of involving the student actively in the reading process. Topics would be originally developed from the previewing, with changes made as a result of the in-depth reading. Students were cautioned that not every question would or should remain in its original form, but that some would change as a result of the **in-depth reading.** The revision of an hypothesis is an essential element in processing and comprehending information. Further, all questions might not be answered as a result of the reading. Either the student would have to scan the material to find missing information or he might have to read additional material to locate an answer. Thus, unanswered questions provided an impetus for review and a focus for further reading. A sample lesson and study grid is included (Appendix A).

After instruction in class, the students applied the questioning and organizational strategies on their own with textbooks from their courses.

Evaluation

Evaluation was done two ways, informal observation and formal testing. Formal evaluation was done using a pretest and posttest included as part of

the Speed Learning program. Students silently read a long passage and answered multiple choice questions. Results were obtained in the categories of rate (words per minute), comprehension (percent correct of questions asked on completed material) and efficiency (wpm times comprehension percentage).

The average pretest rate was 272 wpm, average comprehension was .558 and average efficiency (wpm X comprehension) was 156.

Posttest scores indicated that students rate rose 103 points to 374 wpm, comprehension scores increased 86 points to .644. Average posttest efficiency score was 245 and a gain of 89 points. The effect of the reading course on efficiency gains was a significant at the .01 level (t=3.792). Rate gain was also significant at .01 (t=3.26). However, gains in comprehension were not significant (t=5507). Effectiveness of questioning grids and networking on academic achievement was measured informally only, since the tests were developed too far into the semester to be valid. Students were informally observed applying questioning and networking techniques to their own tests, and feedback from students seemed to be positive and often enthusiastic. Informal feedback from the students appeared positive, particularly when the material they used was poorly organized or contained complex, difficult and new concepts. Over the past few weeks, as finals drew near, increasing numbers of students could be found in the College Skills Center networking notes and chapters during tutorials and study labs.

Conclusion

Because of the small sample and the limited testing and statistical analysis done, no definite conclusions are possible. The significance obtained demonstrates that the reading program offered was better than no reading program, but does not necessarily show that it was better than other possible programs. However, the results were encouraging not only in regard to the level of significance obtained but more importantly, in regard to the high level of student enthusiasm for applying the strategies to regular course work.

Appendix A

Sample Lesson and Study Grid

"We're going to work with an article called 'Asian Puppetry.' Let's think about the questions 'who, what, when, where, why and how' and about what you already know concerning Asia and puppetry. What countries might be included in the category 'Asia'? Now, think about puppetry. You've all watched puppets on TV. Using our six questions as a base, we will speculate on what general kinds of questions we might expect to be raised about puppets."

Students predict the kinds of questions they would expect to have raised. They make a grid with the possible questions written down the left hand side of the paper. Then, they speculate about possible answers. They then preview the article to get an overview of the topics and to find the names of the countries. At this point, the questions may be refined again by the group. A possible grid is included.

"Now, with the grid in front of you, begin to read. As you read verify your questions and jot down notes for answers. After reading you will need to decide which of your questions you can use for further research, because they are important, but have not been answered in this article."

Puppets and Puppetry		Countries							
		The East	India	Ceylon	Java	Bali	China	Japan	Burma
Who	makes								
	uses								
	watches								
What	do they look like								
	are they used for								
When	are they used								
	how frequently								
	duration of use								
	first used								
Where	used in past								
	used now								
	come from								
Why	useful to society								
	useful to country								
	useful to a person								
	continue to be used								
How	achieve purpose								
	effective are they								

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